

MENTHA ARVENSIS AND SOME OF ITS NORTH
AMERICAN VARIATIONS

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A SYSTEMATIC study of *Mentha arvensis* L. and its varieties, var. *canadensis* (L.) Briquet, var. *lanata* Piper and var. *glabrata* (Bentham) Fernald, in North America resulted in the following observations of this group as a whole. 1. There was no noticeable difference in size, shape or sculpturing of the nutlets. 2. There was considerable variation within the same geographical range in (a) leaf-shape and dentation, (b) degree of hairiness of the stem, (c) length of pedicels, (d) size and lobing of calyx and corolla, (e) spacing of the inflorescences. As the plants proved variable in so many ways, it seemed advisable to return to the diagnostic characteristics used by Linnaeus, Bentham, Briquet, Fernald, and Piper, namely, leaf-shape and degree of hairiness. As there were more than 500 specimens of *Mentha arvensis* or its varieties from Alaska, Canada, Newfoundland and the majority of states of the United States in the Gray Herbarium, no specimens from other herbaria were examined. I wish to acknowledge the patient guidance and help of Professor M. L. FERNALD throughout this study.

KEY TO VARIETIES

- Leaves, in region of inflorescences, ovate to elliptic, with more or less rounded bases. 1. *M. arvensis*, var. *typica*.
 Leaves, in region of inflorescences, lanceolate, with more or less cuneate bases. 2. *M. arvensis*, var. *villosa*.

1. MENTHA ARVENSIS L., var. **typica**. *M. arvensis* L., Sp. Pl. 577 (1753).

KEY TO FORMS OF *M. ARVENSIS* L., VAR. TYPICA

- Stem, in region of first-flowering inflorescence, glabrous on sides, minutely pubescent on angles. 1a. f. *glabra*.
 Stem, in region of first-flowering inflorescence, pubescent on sides and angles.
 Angles of stem more pubescent than sides. 1b. f. *typica*.
 Angles and sides of stem more or less equally pubescent.
 Hairs 1–3.5 mm. long, spreading. 1c. f. *lanata*.
 Hairs 0.2–1.5 mm. long, appressed. 1d. f. *puberula*.

1a. Forma **glabra** (Bentham), stat. nov. Stem, in region of first-flowering inflorescence, glabrous on sides, glabrous (rare) or with hairs rarely longer than 1 mm. on angles; petioles and lower surfaces of leaves glabrous to slightly pubescent. *M.*

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arvensis L., δ *glabra* Benth., Lab. Gen. Sp. 179 (1833).—NEWFOUNDLAND: *Fernald, Long & Fogg*, no. 1974; *R. B. Kennedy*, no. 531. QUEBEC: *Victorin, Germain & Meilleur*, no. 43987; *Fernald & Pease*, no. 25256. MAGDALEN ISLANDS: *Fernald, Long & St. John*, no. 7982. MAINE: Rumford, 1890, *J. C. Parlin*. MASSACHUSETTS: Aug. 1, 1908, *Burnham*. NEW YORK: Sept. 5, 1909, *Watrous & Burnham*. PENNSYLVANIA: Aug. 20, 1915, *I. W. Anderson*. WEST VIRGINIA: *Greenman*, no. 243. OHIO: *R. J. Webb*, no. 6. WISCONSIN: *Fassett & Wilson*, no. 5518. ILLINOIS: Aug. 1886, *Robinson*. KANSAS: *Rev. J. M. Bates*, no. 4594. WASHINGTON: *Vasey*, no. 463.

1b. Forma **typica**. Angles of stem, in region of first-flowering inflorescence, always more pubescent than sides, petioles, lower surfaces of leaves, and stem slightly to very pubescent.—Widely distributed, partly naturalized from Europe, partly apparently indigenous, Southern Labrador to Washington, south to Newfoundland, Nova Scotia, New England, Virginia, Kentucky, Nebraska, Colorado and California.

1c. Forma **lanata** (Piper), stat. nov. Stem, in region of first-flowering inflorescence, more or less equally pubescent on angles and sides, hairs 1–3.5 mm. long, spreading; petioles and lower surfaces of leaves more or less densely pubescent. *M. arvensis* L., var. *lanata* Piper, Bull. Torr. Bot. Club **29**: 223 (1902).—NEWFOUNDLAND: Sept. 15, 1937, *B. W. Brooks*. QUEBEC: Aug. 4, 1902, *J. R. Churchill*. NEW BRUNSWICK: *Victorin, Germain & Jacques*, no. 44658. NOVA SCOTIA: *St. John*, no. 1313. MAINE: Sept. 1, 1902, *G. G. Kennedy*; July 14, 1909, *Fernald*; Sept. 15, 1904, *O. W. Knight*. NEW YORK: June 29, 1910, *Burnham*. PENNSYLVANIA: July 19, 1926, *W. M. Benner*. ONTARIO: Aug. 20, 1914, *Eames & MacDaniels*. IDAHO: 1861, *Dr. Lyall*; *Sandberg, MacDougal & Heller*, no. 734. CALIFORNIA: *Mrs. R. F. Bingham*, no. 8; Aug. 16, 1882, *Pringle*; June 1894, *R. D. Alderson*; *Abrams*, no. 4069. WASHINGTON: *Lake & Hull*, no. 603.

1d. Forma **puberula**, forma nov. Regione primae florigerae inflorescentiae capillis plus minusve aequae ad latera et angulos caulis distributis puberula; capillis 0.2–1.5 mm. longis, adpressis; petiolis paginae inferiore foliorum puberulentibus.—PENNSYLVANIA: McCall's Ferry, York Co., Oct. 15, 1892, *Heller & Halbach*, no. 641 (TYPE in Gray Herb.). IDAHO: Boise, July 27, 1911, *J. A. Clark*, no. 154; ("Oregon") Clearwater, *Rev. Mr. Spalding*. WYOMING: Sybille Creek, Albany Co., July 3, 1900, *A. Nelson*, no. 7383. UTAH: Uinta Basin, along irrigation ditch west of Vernal, Uinta Co., Sept. 4, 1931, *Graham*, no. 7416. CALIFORNIA: Fort Tejon and vicinity, near lat. 35° & long. 119°, 1857–8, *de Vesey*, no. 76; *Hartweg*, no. 1910; Yosemite Valley, Mariposa Co., Aug. 8, 1891, *Coville & Funston*, no. 1852. OREGON: Trout Creek, base of Stein's Mts., July 18, 1898, *Cusick*, no. 2043.

2. *MENTHA ARVENSIS* L., var. **villosa** (Benth.), comb. nov. *M. canadensis* L. Sp. Pl. 577 (1753). *M. borealis* Michaux, Fl. Bor.-Am. 2: 2 (1803). *M. arvensis*, α . *villosa* Benth. Lab. Gen. et Sp. 181 (1833). *M. arvensis* L., var. *canadensis* (L.) Briquet, Bull. Herb. Boiss. 2: 707 (1894).

KEY TO FORMS OF *M. ARVENSIS* L., VAR. *VILLOSA*

- Stem, in region of first-flowering inflorescence, glabrous on sides, minutely pubescent on angles. 2a. f. *glabrata*.
 Stem, in region of first-flowering inflorescence, pubescent on sides and angles.
 Angles of stem more pubescent than sides. 2b. f. *typica*.
 Angles and sides of stem more or less equally pubescent.
 Hairs 1–3 mm. long, spreading. 2c. f. *lanigera*.
 Hairs 0.2–1.5 mm. long, appressed. 2d. f. *brevipilosa*.

2a. Forma **glabrata** (Benth.), stat. nov. Stem, in region of first-flowering inflorescence, glabrous on sides, glabrous (rare) or with hairs rarely longer than 1 mm. on angles; petioles and lower surfaces of leaves glabrous to slightly pubescent.—*M. canadensis* L., β . *glabrata* Benth., Lab. Gen. Sp. 181 (1833). *M. arvensis* L., var. *Penardi* Briquet, Bull. Herb. Boiss. 3: 215 (1895). *M. arvensis* L., var. *glabrata* (Benth.) Fernald, RHODORA 10: 86 (1908).—Widely ranging from Labrador to British Columbia, south to Magdalen Islands, New Brunswick, New England, Maryland, West Virginia, Ohio, Michigan, Illinois, Missouri, Kansas, New Mexico, Arizona and California.

2b. Forma **typica**. Angles of stem, in region of first-flowering inflorescence, always more pubescent than sides; petioles, lower surfaces of leaves, and stem slightly to very pubescent.—Newfoundland to Alaska, south to Nova Scotia, New England, Virginia, Ohio, Indiana, Illinois, Minnesota, Nebraska, New Mexico and California.

2c. Forma **lanigera**, forma nov. Regione primae florigerae inflorescentiae, capillis plus minusve aequae ad latera et angulos caulis distributis lanosa; capillis 1–3 mm. longis, patentibus; petiolis paginae inferiore foliorum dense puberulentibus.—MAINE: Fort Fairfield, Aroostook Co., July 16, 1902, *Williams, Collins & Fernald*; Fort Fairfield, Aroostook Co., Aug. 10, 1909, *Fernald*. VERMONT: Charlotte, Sept. 23, 1879, *Pringle*. IDAHO: Valley of N. Fork of Coeur d'Alene Riv., region of Coeur d'Alene Mts., Aug. 14, 1895, *J. B. Leiberg*, no. 1540. CALIFORNIA: From Fort Bragg to Glen Blair, Mendocino Co., Aug. 8–16, 1912, *Eastwood*, no. 1666 (TYPE in Gray Herb.). OREGON: Wet sand along Ten Mile L., Lakeside, Coos Co., Aug. 2, 1919, *Peck*, no. 9018. WASHINGTON: western Washington, June 1922, *J. M. Grant*; margin of an epsom lake north of Chelan, Chelan Co., June 25, 1931, *Thompson*, no. 6913; Lake Tucker, San Juan Islands, June 25–Aug. 1, 1917, *S. M. & E. B. Zeller*, no. 976.

ALASKA: Prince of Wales Island, Klawak Lake, Sept. 12, 1915, *Mr. & Mrs. E. P. Walker*, no. 993.

2d. Forma **brevipilosa**, forma nov. Regione primae florigerae inflorescentiae, capillis plus minusve aequae ad latera et angulos caulis distributis; breviter pilosa; capillis 0.2–1.5 mm. longis, adpressis; petiolis paginae inferiore foliorum puberulentibus. *M. rubella* Rydberg, Mem. N. Y. Bot. Gard. **1**: 337 (1900).—SASKATCHEWAN: Lake Manitou, along the line of the Grand Trunk Pacific Railway, July 21, 1906, *Macoun & Herriot*, no. 78405; Saskatchewan, 1858, *E. Bourgeau*. ALBERTA: Castle Hill District, vicinity of Rosedale, July 27, 1915, *M. E. Moodie*, no. 1129; Loc Craigmyle, July 10, 1922, *A. H. Brinkman*, no. 709; Gov. Hay Camp district, Slave River, about 59° 31' N., 111° 28' W., Wood Buffalo Park, Mackenzie Basin, Aug. 8, 1928, *Raup*, no. 3163. MONTANA: Glacier National Park, Teton Co., July 22–28, 1913, *Hunnewell*, no. 2079; *Kirkwood*, no. 2204. IDAHO: (Oregon) River side (probably near Lapwai), June 14, *Rev. Mr. Spalding*. WYOMING: Lower Geyser Basin, Yellowstone Park, Aug. 4, 1897, *Rydberg & Bessey*, no. 4900; Jackson's Lake, Aug. 4, 1901, *Merrill & Wilcox*, no. 1133; Fort Steele, Carbon Co., Aug. 19, 1901, *Goodding*, no. 542. UTAH: Uinta Basin, east side of Green River, 20 miles south of Vernal, Uinta Co., June 21, 1931, *Graham*, no. 6203. CALIFORNIA: Kaweah River Bottom, Tulare Co., July 5, 1904, *Culbertson*, no. 4204; San Joaquin Valley, Porterville, July 31, 1915, *Abrams*; Pine Grove, Amador Co., July 1895, *G. Hansen*, no. 140; Stubbs Flatt, Lake Co., Oct. 20, 1900, *A. Bowman*; Walker's Basin, Sept. 1875, *Rothrock*; Mendocino, Mendocino Co., Aug. 1898, *H. E. Brown*, no. 870; Sacramento Valley about 6 miles northwest of Chico, Butte Co., July 11, 1914, *Heller*, no. 11561 (TYPE in Gray Herb.). WASHINGTON: Prosser, Yakima Co., July 11, 1902, *J. S. Cotten*, no. 654; near Wenatchee, Chelan Co., June 24, 1931, *Thompson*, no. 6888. BRITISH COLUMBIA: Shawnigan Lake, Vancouver Island, Aug. 7, 1921, *Hunnewell*, no. 7887. ALASKA: Nulato, 1916, *J. A. Kusche*; Circle Hot Springs, near Steese Highway about 138 miles north of Fairbanks, July 17–22, 1936, *E. Scamman*, no. 404; Burroughs Bay, Sept. 19, 1915, *Mr. & Mrs. E. P. Walker*, no. 1013.

Mentha arvensis var. *villosa* (var. *canadensis*), confined chiefly to North America, differs from *Mentha arvensis* var. *typica*, found in general throughout the north temperate region of the world, only in its leaf-shape and less extensive range. In some cases, however, the leaf-shape is somewhere between the ovate type with rounded base of *M. arvensis* var. *typica* and the lanceolate type with cuneiform base of *M. arvensis* var. *villosa*. One does not know whether to assign plants with this intermediate type of leaf-shape to var. *typica* or var. *villosa*. The

amount of pubescence on the stems, leaves, petioles and calyces passes through a similar curve of variation, in this case from a glabrate to a short-haired and a long-haired form in both var. *typica* and var. *villosa*. In as polymorphic a species as *M. arvensis* this is not unexpected. I do not, therefore, feel that these extremes of variation merit varietal rank. Such being the case I have reduced former varieties to forms and proposed parallel forms for *M. arvensis* var. *typica* and *M. arvensis* var. *villosa*.

Piper states in his description of *M. arvensis* var. *lanata* that this variety has the size and habit of *M. arvensis* var. *villosa*. An examination of Piper's isotype discloses a plant with the type of leaf-shape which could be determined as either *M. arvensis* var. *typica* or *M. arvensis* var. *villosa*, tending, however, more towards var. *typica*. Of the seven specimens Piper cites, five are represented in the Gray Herbarium, and these I have found to be closer in leaf-shape to var. *typica* than to var. *villosa*. *M. arvensis* var. *lanata* has, therefore, been reduced to a form of *M. arvensis* var. *typica*, a parallel form being defined for *M. arvensis* var. *villosa*.

The two new forms, *M. arvensis*, var. *typica*, forma *puberula*, Pennsylvania, Idaho, Wyoming, Utah, California, Washington, and *M. arvensis* var. *villosa* forma *brevipilosa*, Saskatchewan, Alberta, Montana, Idaho, Wyoming, Utah, California, Washington, Vancouver Island, Alaska, seem to have a fairly definite geographical range. I do not, however, think they are varieties but rather forms, similar to var. *typica*, f. *lanata* and var. *villosa*, f. *lanigera* but possessing shorter hairs. There are also occasions when it is difficult to separate var. *typica*, f. *lanata* from var. *typica*, f. *puberula* and var. *villosa*, f. *lanigera* from var. *villosa*, f. *brevipilosa*. If more specimens from the Middle West and Middle Atlantic states had been available I believe var. *typica*, f. *puberula* and var. *villosa*, f. *brevipilosa* would be found to have a more extensive range.

M. arvensis L., var. *Pavonia* Briquet (Mexico) and *M. arvensis* L., var. *Schmitzii* Briquet (New Mexico), described by Briquet, Bull. Herb. Boiss. 2: 708 (1894), were not studied as there were no cited specimens available. *M. arvensis* L., var. *occidentalis* (Rydb.) Jones, *M. occidentalis* Rydberg, Bull. Torr. Club 36: 687 (1907), was omitted for the same reason.

ALEXANDRIA, VIRGINIA.